
मृदा-संचालन मशीनरी — सुरक्षा
भाग 8 ग्रेडर्स की अपेक्षाएँ
(दूसरा पुनरीक्षण)

Earth-Moving Machinery — Safety
Part 8 Requirements For Graders
(Second Revision)

ICS 53.100

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FOREWORD

This Indian Standard (Part 8) (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Material Handling Systems and Equipment Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard supersedes the IS 17055 (Part 8) : 2019/ISO 20474-8 : 2017 'Earth moving machinery — Safety: Part 8 Requirements for graders'.

This Indian Standard is published in several parts. The other parts in this series are:

- Part 1 General requirements
- Part 2 Requirements for tractor dozers
- Part 3 Requirements for loaders
- Part 4 Requirements for backhoe loaders
- Part 5 Requirements for hydraulic excavators
- Part 6 Requirements for dumpers
- Part 7 Requirements for scrapers
- Part 9 Requirements for pipelayers
- Part 10 Requirements for trenchers
- Part 11 Requirements for earth and landfill compactors
- Part 12 Requirements for cable excavators
- Part 13 Requirements for rollers

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard***EARTH-MOVING MACHINERY — SAFETY****PART 8 REQUIREMENTS FOR GRADERS***(Second Revision)***1 SCOPE**

This standard (Part 8) specifies the safety requirements of graders as defined in IS/ISO 6165. It is intended to be used in conjunction with IS 17055 (Part 1), which specifies general safety requirements common to two or more earth-moving machine families. The specific requirements given in this standard take precedence over the general requirements of IS 17055 (Part 1).

1.1 This standard deals with all significant hazards, hazardous situations and events relevant to the earthmoving machinery within its scope [see IS 17055 (Part 1), Annex A] when used as intended or under conditions of misuse reasonably foreseeable by the manufacturer. It specifies the appropriate technical measures for eliminating or reducing risks arising from relevant hazards, hazardous situations or events during commissioning, operation and maintenance.

2 REFERENCES

The standards listed below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards indicated below:

<i>IS No./Other Publication</i>	<i>Title</i>
IS/ISO 6165 : 2012	Earth-moving machinery — Basic types — Identification and terms and definitions
IS/ISO 7096	Earth moving machinery — Laboratory evaluation of operator seat vibration
IS/ISO 7134 : 2013	Earth-moving machinery — Graders Terminology and commercial specifications
17055 (Part 1) : 2018	Earth-moving machinery — Safety: Part 1 General requirements

3 TERMS AND DEFINITIONS

For the purposes of this standard, the terms and definitions given in IS 17055 (Part 1) and IS/ISO 7134 shall apply in addition to the following.

3.1 Grader — Self-propelled wheeled machine with an adjustable blade positioned between the front and rear axles, which can be equipped with a front-mounted blade or scarifier that can also be located between the axles.

NOTE — To entry:

- a) The machine is primarily designed for grading, sloping, ditching and scarifying of materials through its forward motion.
- b) See Annex A for illustrations.

4 SAFETY REQUIREMENTS AND PROTECTIVE MEASURES**4.1 General**

Graders shall comply with the safety requirements and protective measures of IS 17055 (Part 1), in as far as those are not modified by the specific requirements of this clause.

4.2 Operator Station**4.2.1 Operator's Seat**

Graders shall be equipped with a suspension seat as per IS/ISO 7096.

4.2.2 Rear Windows

Clause **4.3.2.7** and **4.3.2.9** of IS 17055 (Part 1), shall apply for rear windows, with the following additional provisions:

- a) Arrangements for defrosting the rear windows shall be made; and
- b) The rear windows shall be fitted with a motorized washer and wipers.

4.3 Fenders

Clause **4.14.7** of IS 17055 (Part 1), shall apply with the exception that front wheels do not require fenders.

4.4 Steering System**4.4.1 General**

Clause **4.6.1** and **4.6.2** of IS 17055 (Part 1), shall apply in addition to the **4.4.2** and **4.4.3** below.

4.4.2 Controls

Wheel, articulated and bogie steering shall be actuated by separate controls.

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4.4.3 Steering Performance Test

Clause 4.6.2 of IS 17055 (Part 1), shall apply with the following additions:

- a) The steering performance test shall be conducted with the front steering system (Ackermann steering system) only; and
- b) During testing, leaning front wheels and articulated or bogie steering systems shall be kept in the vertical and straight ahead positions respectively.

4.4.4 Safety Requirements for Travelling Mode

It shall be possible for the controls of a leaning front wheel system to be mechanically locked in the vertical position.

5 INFORMATION FOR USE

Clause 6.2 of IS 17055 (Part 1), shall apply with the following additions:

- a) Instructions shall be provided on how to use grader steering on public roads;
- b) Instruction shall be given that all blades and equipment are to be placed in their transport positions such that they are within the defined transport width of the machine; and
- c) Instructions regarding any other system(s) installed in the machine shall be provided.

6 BIS CERTIFICATION MARKING

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

ANNEX A
ILLUSTRATIONS

See Figures A.1 to A.3.

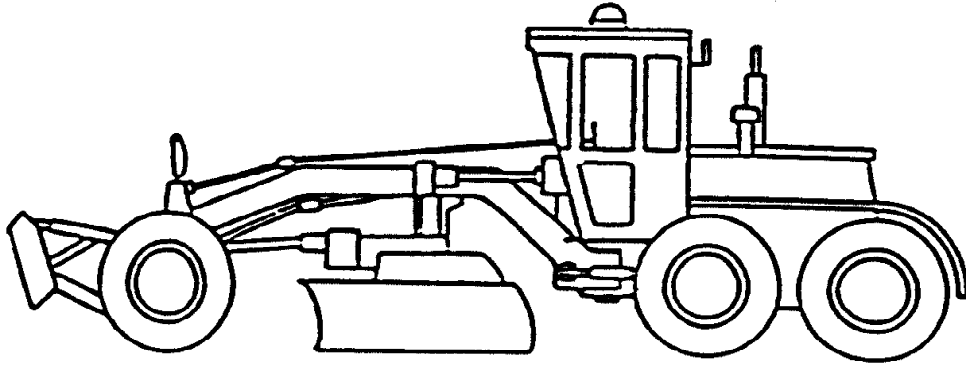


FIG. A.1 — ARTICULATED STEERED GRADER

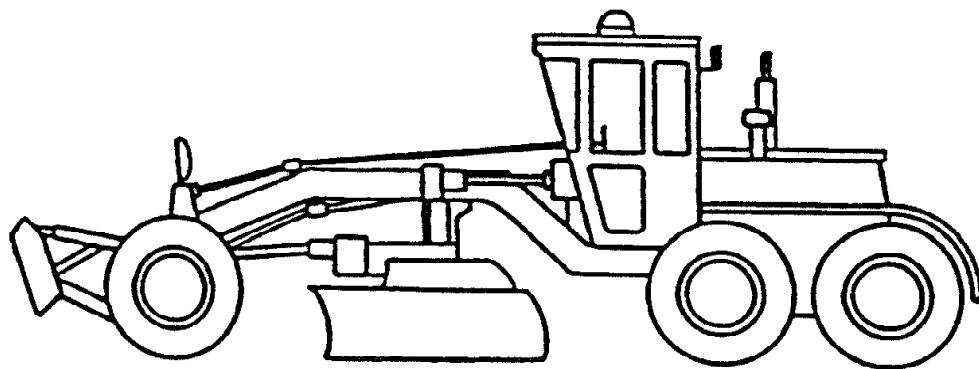


FIG. A.2 — WHEELED STEERED GRADER

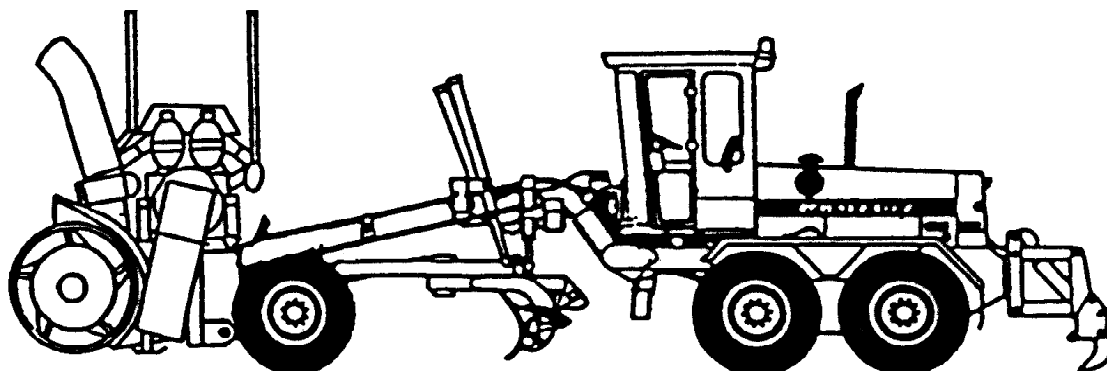


FIG. A.3 — GRADER WITH SNOW-BLOWER

ANNEX B

(Foreword)

COMMITTEE COMPOSITION

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